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Paper Session II-A - Satisfying User Requirements - Space and the Operational Commander

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ABSTRACT

In the past, satellites were designed without adequately discussing issues with the users. This is an extremely poor business practice; if the acquisition community were a competitive business, that attitude would be considered a precursor to failure. A change in attitude comparable to the customer awareness inherent in a competitive environment would have several positive benefits. First, product design would be tailored to the customer's real needs. Second, this awareness would foster searching out the most cost-effective (in terms of time, money, technology, etc.) methods of providing equipment.

INTRODUCTION

Warfighting commands need sustainable and survivable lines of communications. This statement should come as no surprise to anyone; communications are vital to a coordinated warfighting effort, and serve to insure maximum utilization of resources. This principle has been recorded as early as Sun Tzu, who wrote "And to control many is the same as to control few. This is a matter of formations and signals." Many battles throughout history have been lost for lack of a crucial piece of information being either relayed or received in a timely manner.

Operational communications requirements are ultimately translated into such vehicles as command networks or conference bridges, secure voice or data systems, data relay systems, or any of many other possible methods of achieving transference of needed information. Some of these vehicles will require partial or total reliance on satellite communications to achieve their long-haul links.

The usual way for the user to communicate this desire for satellite communications support is to submit a request for inclusion in the User Requirements Data Base. Periodically, these new submissions are reviewed for validation. If validated, additional processing is required; its nature is dependent on the satellite system for which the request was approved. When these requirements are presented to the acquisition community, they come in the form of compiled data. The identity of the users and urgency of their needs do not get transferred with the data.

One might ask why this would be of any importance to the acquisition community; after all, satellites are designed to fulfill specifications that come directly from that compiled data. This is true; however, that

compiled data does not relay information about application and the cost to the user if that capability is not available. The sense of urgency that such information imparts is critical to an attitude analogous to "competitive edge" in a commercial concern. The statement "We need a satellite that will pass X megabits per second" is hardly inspiring, and would motivate very few people to work faster, harder, or smarter. If you take the same requirements and also define them as "We need a satellite that will enable CINCSAC to place their bombers optimally in case of an attack on CONUS, and will enable CINCSPACE to get real-time missile information, etc.", people will see a need and gain a time awareness for them - assuming they have had certain experiences or have been in the military for a sufficient length of time.

A lack of common core of communications between the operational and acquisition communities lies at the heart of the problem. Traditionally, there has been little one-on-one interaction between these two communities. This has been compounded by the acquisition community being somewhat insular in nature. PCS moves from one product division to another give people little exposure to the operational military. Program offices have few people who have had direct exposure to warfighting needs; many of these people hold AFSCs that are not traditionally tied to Systems Command, and consequently are not guaranteed to stay within the command for more than one tour. Additionally, a significant number of program office personnel are on their first assignment, and carry with them no sense of how the military really functions. Cumulatively, this results in an acquisition community that at the working level has little feel for how the operational commands accomplish their missions.

A BUSINESS ANALYSIS

Before we can analyze whether methods employed by the acquisition community can be improved upon, let us review what the customer really wants. The ultimate desire is for communications service - to enable information to be relayed to or received from someone else. There are three corollary desires in obtaining that service:

- The user desires 100% requirements satisfaction
- The user desires this satisfaction to be met in conjunction with his real-time needs
- The user desires usable end-to-end service

Operational commanders have to maintain lines of communications appropriate to both their peacetime and wartime roles and responsibilities. Additionally, operational commanders are as keenly aware of budget constraints as the acquisition community; their stated requirements are not frivolously submitted. Also, consider that networks do not consist of space on a satellite alone; these networks

represent considerable capital outlay to the operational commander's budget in terms of commercial ground circuits, terminal equipment, user consoles, etc. If that space on a satellite is not available, the entire network may be rendered useless.

This takes us to the issue of real-time satisfaction. Even though the satellite communications requirement is not met, the operational requirement does not go away. The command can either reconfigure the network to incorporate lower capabilities which can be satisfied, or they can wait to be satisfied at some point in the future.

The last desire is a issue of system design and timeline coordination. A satellite cannot stand alone; nor can a ground terminal. It is of no use to the operational commander for one component of the communications system to be in place and functional while other components are delayed in delivery.

Now, if one were to establish a corporation that intended to compete for this customer's business, what measures would they be likely to take? They would first make it their business to know this customer - what he wanted, how he intended to use it, what cost if the product desired were not available. They would create an atmosphere where continuous dialog between themselves and the customer could flow, where impacts and tradeoffs could be discussed to the benefit of both parties. For example, a technology might surface that would give a slight gain in performance, at the cost to the customer of a one-year delay. The gain in performance might be worth it to most of the customers; but if not, and the company were to proceed anyway, all parties would lose. The customers would lose time and satisfaction; the company would lose money and effort better applied to other things. This company would produce a product which would be usable as a system; if they did not produce it solely in-house, the subcontractor portion would be closely coordinated and scheduled to come available on time. The system's life-cycle requirements would also be factored in as a consideration in the overall product package.

Now if you compare this to contemporary acquisition practice, there are a few obvious differences. For the most part, our knowledge of the operational commanders' requirements relies on a huge data base and published analyses of requirements. These items, useful as they are, don't convey the "big picture" as regards their use. They also don't impart a sense of under what conditions a delay in service would be deemed acceptable. Also, we don't tend to build systems under the aegis of one organization. Since we don't build as one system, there is a problem with life-cycle costs not being considered as a system. If funding is cut in one area, it can be detrimental to the whole system, regardless of its stage in the acquisition process.

The customer, of course, is going to choose the provider who can supply the service desired with minimum operational impact and maximum economy of effort. The customer is also likely to be more comfortable with the provider who is familiar with his needs and receptive to his inputs. These are qualities the acquisition community finds desirable when dealing with contractors. It should come as no surprise that the

operational commands would find the qualities of an informed and system-oriented provider to be equally desirable in their acquisition community. In a market-driven environment, our approach would be doomed to failure, simply because someone else eventually will come on the scene who is committed to doing it better.

THE "COMPETITIVE EDGE"

How do we get that "competitive edge", to do our best efforts with a sensitivity to our customers' needs? This is fairly straightforward with commercial concerns - the law of the marketplace prevails. You lose market share, you lose revenue; loss of revenue can mean loss of profits, or it can translate into less money to invest back into the capabilities of the company. Essentially, the competitive edge is externally imposed.

We, on the other hand, do not have any competition to impose this heightened sense of awareness upon us. Therefore, we must commit to engender it within ourselves, the acquisition community. Though this is by no means an exhaustive list, there are three things we can do to improve our awareness:

- Employ Total Quality Management techniques
- Engage in direct interaction with relevant components in the user communities
- Disseminate operational "sense of urgency" to acquisition personnel

Total Quality Management (TQM) is being strongly advocated in the acquisition community. As one reviews Dr. Deming's Fourteen Points, the underlying themes of working together as a cohesive unit and striving always for top performance rise to the surface. As TQM awareness improves, one can expect our "competitive" performance to improve. TQM alone is not the answer; we also need to be aware of what we are trying to accomplish.

Interaction with the users should be an ongoing practice. This could prove to be an invaluable sanity check throughout the acquisition process. It is true that some program offices have people on staff with operational experience; however, there are many aspects to national defense. These staff personnel may not have appropriate experience, they may not be current, or they may not possess the "big picture". On the other hand, the operational commander's staff does. The best places to start are a command's Plans/Programs and Communications divisions.

There are a number of methods which could be employed to indoctrinate acquisition personnel on the impact of unavailable communications. I believe that there is none better than direct observance (or a

reasonable facsimile thereof). For example, as observers in a major exercise, acquisition personnel could observe firsthand the linear relationship between loss of communications and erosion of command and control. From there, it is simple to see the impact of not having the communications capability at all.

BENEFITS

Before we would commit ourselves to a course of maintaining open discussions with the users and soliciting their inputs on design considerations, we should first establish what there is to be gained. Our first gain would be design and schedule attuned to the operational commander's real needs. Of course, since there are a multitude of users, not all needs could be satisfied for all users. In some instances, the technology is not yet sufficient to their needs. But overall, the user's needs and timelines would drive design and schedule, rather than technological fine-tuning.

Technological fine-tuning leads us to the second gain, which is cost effectiveness, in both time and money. State-of-the-art advances have to be evaluated as a tradeoff against needs; putting it another way, is what you gain technologically sufficient to offset what you lose in terms of timely service? If a majority of your users need the service now and the current technology is sufficient, then "improving" the design could be detrimental to the national defense. Without some sort of sanity check, there is also the real possibility of "improving" a program so often that it doesn't gets built. Also, as you go further out in time, there are two fiscal dangers which must be considered. The longer a program drags out in acquisition, the more it costs to build. And, in these fiscally conservative times, there is the ever-present danger of budget cuts or cancellation. The best way to evaluate the impacts of a proposed design change is to talk to the people who need the service, and consider their inputs with the merit they deserve.

CONCLUSION

The operational and acquisition communities have been separated in the past by the lack of a common core of communications and a large collection of documents. As these communities come to work together in acquiring equipment designed to meet required capabilities, we will come closer to our common goal - defense of the United States and her allies.

BIBLIOGRAPHY

Deming, W. Edwards, Out of the Crisis, Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, Mass., 1986

Sun Tzu, The Art of War, Oxford University Press, New York, 1971